LETTER DETAILING AMENDMENTS TO CLAIMS.

With respect to PCT application number PCT/US01/20069, under Article 34 please amend the claims as follows.

The original set of 43 claims is replaced by the amended set of 46 claims attached hereto and incorporating the following amendments.
Claims 3-5, 10, 11, 14, 15, 18, 20, 22, 26-39, 41 and 42 are unchanged.
Original claim 43 is replaced by a new claim with the same number claiming different subject matter.
New claims 44-46 are added.
All remaining claims claim the same subject matter as the original claims bearing the same numbers, but the language is amended as follows:

1. Structure described more specifically, purpose defined as facilitating change.

2. Added the restriction that one member is a multi-mode keyboard.

6. Now specifies not more than 5 rows of keys in alphanumeric section to limit claim to integrated alternative options, excluding external alternative options such as Miller's or Torok's subsets of keys below the spacebar. Amendment also excludes function operations from the alternative options by specifying the typing of graphic characters. See also replacement claim 43 claiming a related method.

7 - 9. Original claims 7 - 9 which possibly confused method and apparatus are amended to more distinctly claim only an apparatus. See also new claims 44 - 46 claiming related methods.

12. Amended to particularly point out and distinctly claim the structure.

13. Amended to specify a capacity of 82 characters, which Harbaugh fails to provide.

16. Amendment clarifies that cursor cross is an integral part of the alphanumeric rows and columns, unlike Braun or Schmidt.

17. Amended to more particularly describe the structure.

19. Capacity of 82 characters is specified. Redundant phrase "assigned to at least some of said keys" is deleted to resolve ambiguity. Mention of thumb keys added to provide antecedent for claim 21.

21. Amended to clarify language.

23 - 25. Added the restriction, "with the typist's hands in position for touch typing".

40. Specified that the symmetrical cross forms an integral part of the rows of the alphanumeric section, unlike Braun.

43 - 46. Original claim 43 canceled, new claims 43 - 46 added. Methods claimed here relate to the apparatus claims 6 - 9 respectively.

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I claim:

1. A family or series of at least three separate keyboards, each of said keyboards having an alphanumeric section containing a plurality of keys including character keys for at least the letters of an alphabet, each of said alphanumeric sections having a key arrangement that differs from the key arrangment of other alphanumeric sections in said family or series but has compatibility means to ensure at least consecutive compatibility between successive keyboards of said family or series, whereby said family or series may facilitate the implementation of a change in the accepted standard layout of alphanumeric keys for keyboards in general.

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2. The family or series of claim 1 wherein at least one member is a standardized keyboard generally conforming to the existing standard design under ISO/IEC 9995, at least one member is a keyboard intended as a new standard design, and at least one member is a multi-mode keyboard compatible with both of said existing and new standard designs.

3. The family or series of claim 1 having a common key arrangement for at least some of the keys in said alphanumeric section in each member keyboard.

4. The family or series of claim 3 wherein said common key arrangement is an arrangement having a certain measure of horizontal offset between keys in adjacent rows for a group of at least four keys in at least three successive rows, said certain measure being equal to one half of the horizontal center spacing of a pair of said four keys in one of said three successive rows.

5. A member keyboard of the family or series of claim 4.

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6. A multi-mode, electronic keyboard suitable for two-handed touch typing and having an alphanumeric section with not more than five rows of keys, said alphanumeric section having at least one shift key and a plurality of keys for typing graphic characters, characterized in that said alphanumeric section has, for at least four graphic characters, alternative option means to be used according to operator preference allowing at least two alternative options for conveniently touch-typing the identical characters.

7. The keyboard of claim 6, said alternative option means including a first means for typing certain characters on their own keys, and a second means for typing said certain characters by shift-selecting them on other keys.

8. The keyboard of claim 6, said alternative option means being key arrangement means with at least one shift key positioned for convenient operation by either a thumb or an index finger.

9. The keyboard of claim 6, said alternative option means being a key arrangement wherein at least one shift key is positioned relative to at least some of the graphic character keys so as to allow at least some shift-selected characters to be conveniently typed either by using one digit on each hand, or by using two digits on one hand.

10. The keyboard of claim 6, said means being reversing means for using alternative configurations of columns of keys selected by reversing all or part of said keyboard.

11. The keyboard of claim 6, said means being key arrangement means for using alternative configurations of columns of keys selected on fixed keys.

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12. An electronic keyboard with an alphanumeric section including a left hand group of at least five touch-typing columns of graphic character keys laterally symmetrical to a right hand group of at least five touch-typing columns of graphic character keys, said alphanumeric section having graphic character keys for at least the numerals 1 and 6,
characterized in that the numeral 6 is allocated to a key for the right hand in keeping with the accepted standard touch-typing arrangement,
and further characterized in that said alpha-numeric section has
keys arranged in at least five transverse rows,
which for reference may be designated alphabetically as a spacebar row A closest to the operator and adjacent rows B, C, D and E successively more remote from the operator, these designations following the precedent set in International Standard ISO/IEC 9995,
the keys also being arranged in columns,
which for reference may be designated by three-digit column numbers increasing numerically from left to right with 101 designating that reference column containing the key for numeral 1, such that any key position may be uniquely identified by row and reference column designation, such as E-101, where said reference columns do not necessarily correspond to said touch-typing columns, said alpha-numeric section also having
a spacebar in row A extending at least from key position A-003 to A-007,
at least 10 graphic character keys in row B within the range B-000 to B-011,
at least 11 graphic keys in row C within the range C-001 to C-015,
at least 12 graphic keys in row D within the range D-001 to D-015,
at least 12 graphic keys in row E within the range E-000 to E-015,
a left-hand level 2 select or shift function key all or part of which is in key position B-099,
a right-hand shift key in row B adjacent to the right-hand end of the row of graphic keys,
a tabulation key at least partially in position D-000 adjacent to the row of graphic keys,
a key for a lock function at least partially in position C-000 adjacent to the row of graphic keys,
a return function key at least partially in row C adjacent to the right-hand end of the row of graphic keys,
and a key for a backspace or backward erase function.

13. The keyboard of claim 12, having a capacity of at least 82 graphic characters and a space character within said alphanumeric section, and further characterized in that within said alphanumeric section all other finger keys provided for the left hand are in columns immediately adjacent to said left hand group, and all other finger keys provided for the right hand are in columns immediately adjacent to said right hand group.

14. The keyboard of claim 12 having a home row, and further characterized in that with respect to said home row all of the columns in said left hand group and said right hand group are not perpendicular to said home row but lean towards the opposite group.

15. The keyboard of claim 14 further characterized in that, within said left hand group and within said right hand group, adjacent columns are more widely spaced at the top than at the bottom.

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16. An electronic keyboard having an alphanumeric section with a plurality of keys arranged in rows and columns, and having a symmetrical cross arrangement of four cursor control keys including a pair of left and right arrow keys immediately adjacent to one another laterally with a third arrow key above said pair and a fourth arrow key below said pair, wherein said symmetrical cross arrangement forms an integral part of said rows and columns of said alphanumeric section.

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17. The keyboard of claim 16 wherein said symmetrical cross arrangement approximately determines symmetrical angles for those of said columns that are immediately adjacent on either side of said symmetrical cross arrangement and that may be assigned to the index fingers of an operator.

18. The keyboard of claim 16 wherein a home row has fourteen keys, a row immediately below said home row has fifteen keys, a row immediately above said home row has fifteen keys, and a row second above said home row has fourteen keys.

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19. An electronic keyboard having an alphanumeric section, said alphanumeric section having a plurality of keys including finger keys and thumb keys arranged in rows and columns, having a home row, having graphic characters, invisible characters, and at least one shift function, having a graphic character capacity of at least 82 characters, and having a home group of five columns of finger keys for each hand, characterized in that all graphic characters within said alphanumeric section are assigned to keys within said home groups.

20. The keyboard of claim 19, further characterized in that all graphic character keys are within one key of said home row.

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21. The keyboard of claim 19, wherein thumb home keys for each thumb are considered to be additional home groups, characterized in that all of said shift functions and invisible characters are within one key of one of the four home groups.

22. The keyboard of claim 19, having a graphic character capacity of at least 90 characters.

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23. An electronic keyboard having a plurality of character keys and at least two shift keys, characterized by having at least one of said shift keys located for convenient operation by an index finger with the typist's hands in position for touch typing.

24. The keyboard of claim 23 further characterized by having at least one shift key located for convenient operation by a thumb with the typist's hands in position for touch typing.

25. The keyboard of claim 24 further characterized by having at least one shift key arranged for convenient operation by either a thumb or an index finger according to user preference, while the user's hands are in position for touch typing.

26. An electronic keyboard for two-handed operation, having an alphanumeric section with a plurality of character keys and at least two shift keys, characterized by having at least one shift key for each hand arranged to facilitate one-handed shift-character operations.

27. The keyboard of claim 26 further characterized by having three shift keys for each hand arranged to facilitate one-handed shift-character operations.

28. The keyboard of claim 27 further characterized by having said three shift keys for each hand arranged for convenient operation by either a thumb or an index finger.

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29. An electronic keyboard, with at least one shift key having the combined functions of a shift key and a shift-lock key, said functions being differentiated electronically in response to distinctive key operating procedures.

30. The keyboard of claim 29 wherein said operating procedures generally rely on a similar procedure in full measure and in half measure to respectively lock and release the shift, for example, double-clicking to engage an electronic lock, and a single touch to release said electronic lock.

31. An electronic keyboard with an alphanumeric section having keys arranged in rows including at least a home row, a row above said home row, and a row below said home row, with letters assigned to at least some of said keys, and having at least two shift functions, wherein one of said shift functions selects numeral characters on said home row.

32. The keyboard of claim 31 wherein the horizontal key center-spacing in individual rows is arranged as if all rows are of the same length, and as if said home row has fourteen keys, as if said row above has thirteen keys, and as if said row below has fifteen keys, irrespective of the actual number of keys in each row.

33. The keyboard of claim 31 further characterized by having three independent shift functions, and four groups of characters predominantly relating to the following natural character classifications: small letters; capital letters; numerals; and symbols.

34. The keyboard of claim 33 further characterized in that each shift group has a capacity of thirty characters.

35. A computer keyboard suitable for two-handed typing and general-purpose applications, with an alphanumeric section having:
a plurality of keys arranged in less than six rows;
at least one shift function and a basic graphic character capacity of at least 96 characters;
space, tab, and return functions, otherwise known as invisible characters;
an enter function, alone or in combination with another function;
a command function;
left-right symmetry; and
at least one pair of shift keys located closer to the center than to the ends of said rows.

36. The keyboard of claim 35 wherein said alphanumeric section has four rows of keys.

37. The keyboard of claim 36 having keys so arranged as to permit the choice of using one hand or two for the shift-selection and typing of a character.

38. The keyboard of claim 35 having editing functions and command functions integrated into said alphanumeric section so that editing and command sections are unnecessary.

39. The keyboard of claim 38 having three separate shift functions and having four groups of characters predominantly relating to small letters, capital letters, numerals, and symbols.

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40. The keyboard of claim 35 having central arrow keys arranged on three rows of keys in a symmetrical cross forming an integral part of said rows, with a left arrow immediately adjacent to a right arrow.

41. The keyboard of claim 40 having at least one shift key arranged for convenient operation by an index finger or a thumb according to user preference.

42. The keyboard of claim 41 wherein said alphanumeric section has four rows of keys,
has editing and command functions integrated into said alphanumeric section,
has keys so arranged as to permit the choice of using one hand or two for the shift-selection and typing of a character,
has three shift functions, and
has four natural groups of characters predominantly relating to small letters, capital letters, numerals, and symbols.

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43. A touch-typing method of typing characters from within the alphanumeric section of a keyboard, characterized in that said method includes a choice, according to operator preference, of at least two different ways of physically typing the identical character for at least four characters.

44. The typing method of claim 43, wherein said method has a choice of one method of typing numeral characters on their own keys, or a second method of shift-selecting them on other keys, such as keys in a home row.

45. The typing method of claim 43, wherein said method has a choice of typing shift-selected characters by operating the shift key with either an index finger or a thumb.

46. The typing method of claim 43, wherein said method has a choice of simultaneously operating a shift key and a character key either with two hands, or with one hand.

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